



# ZANZIBAR PROTECTORATE.

---

REPORT ON THE PUBLIC HEALTH DEPARTMENT

FOR THE YEAR

1914.

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ZANZIBAR:

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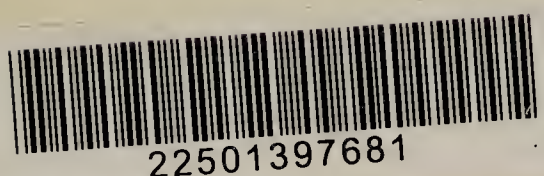
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REPORT ON THE PUBLIC HEALTH DEPARTMENT  
FOR THE YEAR 1914.

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# ZANZIBAR PROTECTORATE.

## PUBLIC HEALTH DEPARTMENT REPORT FOR 1914.

### PART I.—GENERAL.

In submitting the Annual Report in the absence of the Medical Officer of Health I wish to point out the fact that owing to Major Skelton's going on leave suddenly it devolved on me to get it ready at very short notice. Major Skelton had however indicated the lines on which to proceed, but there was no time to discuss the report.

There has been no change in organisation and working of the Department in spite of the heavy tax on its resources, entailed during the last half of the year. From the Head of the Department to the gang of street sweepers all have been more or less on active service, owing to the state of war in the East African Protectorate.

Sanitation has been well up to the standard of previous years.

Matters of special importance mentioned in the Medical Officer of Health's Report for 1913 *e.g.* Beri-Beri and Filariasis have been put aside not only from lack of material but owing to the fact that almost throughout the year either the Medical Officer of Health or I have had to undertake the supervision of the entire work of the Health Office.

The Medical Officer of Health gave health lectures which were well attended. They were open to the Public Health Staff, Senior Scholars of the Government School, the Teaching Staff of the Government School, the Missions and any other who cared to attend.

Synopsis of these lectures as below:—

#### *Lecture I.*—Nature of disease

Relation of Public Health Service to Disease.

Causation of Disease.

1. Parasitic-bacterial  
" protozoal
2. Intoxicational and Industrial
3. Constitutional-bacteria  
protozoa.

#### *Lecture II.*—(Recapitulation above)

1. Transmission of Disease
2. Infection
3. Contagion
4. Examples
5. Prevention (roughly).

#### *Lecture III.*—Recapitulation

1. Principles of Disease Prevention
2. Direct infection
3. Carrier infection.
4. Details-Removal  
Contacts  
Disinfection  
Destruction of cause  
Protection of healthy.

#### *Lecture IV.*—(Recapitulation)

1. The blood
2. Composition
3. Functions of elements
4. Blood disease
5. The lungs
6. Function
7. Kidneys
8. The liver.



*Lecture V.*

Malaria  
History  
Distribution  
Nature of  
Symptoms  
Treatment.

*Lecture VI.*

Mosquitoes.

*Lecture VII.*

Mosquitoes (continued).

} By Dr. Aders.

*Lecture VIII.*

Prevention of Malaria  
Personal  
Public  
Mosquito destruction.

*Lecture IX.*

Plague  
History  
Distribution  
Symptoms  
Varieties  
Prevention  
Rats and Fleas by Dr. Aders  $\frac{1}{2}$  an hour.

}  $\frac{1}{2}$  an hour

*Lecture X.*

Cholera and Typhoid  
Huts  
Distribution  
Causation  
Flies as disease carriers.

*Lecture XI.*

Small-pox  
History  
Contagion  
Symptoms  
Vaccination  
Story of above  
A few figures.

*Lecture XII.*

The Filariae  
Life history of *Microfilaria bancrofti* as example  
Consumption  
Cause  
Prevention.

*Lecture XIII.*

Soap and water  
The house we live in  
Water  
Open Air  
Formation of Health habits  
Venereal Disease.

*Field Work.*

1. Mosquito breeding-places  
Identification
2. Drainage of Swamps
4. Markets and flies.

## ORGANISATION OF DEPARTMENT.

*Special Work.*—Since the outbreak of war the Public Health Department Staff had various duties to perform in addition to their daily work.

On the 2nd and 3rd August a gang of 150 men with three Sub-Inspectors were detailed for filling in coal in lighters to supply the Men-of-war which were in the harbour. The men worked night and day.

On the 20th August a Field Ambulance Corps was organised and the services of the able bodied men of the Public Health Department have been engaged for this work. A corps consisting of 215 men including one Sub-Assistant-Surgeon and one Sub-Inspector of the Public Health Department and one Sub-Assistant-Surgeon of the Medical Department is now in British East Africa.

*Camp Sanitation.*—On the 13th November a (Gwalior) detachment of Indian Troops was camped at Ziwani Lines. A gang of 6 men was detailed daily for general sanitary work. Seven trenches each 50' long 3' deep and 2' wide were laid and filled in after being thoroughly disinfected. All rubbish from the Camp was removed and buried in pits.

The Detachment left for Chukwani on the 4th December and to help with the Sanitation of this place a gang of 4 sweepers and one headman was organised.



# HEALTH OFFICER.

ASSISTANT HEALTH OFFICER'S DIVISION.	(2) RESEARCH DIVISION.	(3) VETERINARY DIVISION.	(4) CHIEF SANITARY INSPECTOR'S DIVISION.	(5) PREVENTION OF INFECTIOUS DISEASES DIVISION.	(6) CLERICAL (7) SUBURBAN (8) PENBA DIVISION.	(9) SCHOOL MEDICAL SERVICE
Bacteriological Dept. Laboratory assistant General duty man (b) Port Medical Service. 1 sub. asst. surgeon (dhow inspector) 5 boat boys	1 economic zoologist 2 general duty men	(a) Cattle Quarantine Station. 1 veterinary officer 5 general duty men (b) Slaughter-house and Hospital. 1 headman 6 sweepers 2 general duty men	(a) Prison Island Quarantine Station. 1 superintendent 10 attendants (b) Infectious Diseases Hospital. 1 hospital assistant 5 attendants (c) Vaccination and Inoculation. 1 chief inoculator 3 assistants (d) Leper Settlements. 2 sub-inspectors 12 general duty men	(a) Finance. 1 head clerk (b) Stores. 1 storekeeper 1 carpenter 1 mason 1 caretaker 3 general duty men (c) Statistical Dept. 1 clerk 1 examiner of the dead 1 Indian reporter of births 1 messenger 1 office boy	Medical Officer of Health.	
(a) Town Sanitation. (1) Conservancy. 5 sub-inspectors 4 Indian overseers 9 headmen 50 sweepers 126 cartmen (2) Disinfection. 15 gangmen 2 cleaners.	(b) Mosquito Brigade. 5 inspectors 15 general duty men	(c) Rat Brigade. 1 dissector 7 assistants	(d) Markets. 1 headman 6 sweepers	(e) Public Graveyards. 3 general duty men	(f) Dhoby Station. 3 general duty men	
			CHAKE. 1 Sanitary inspector 1 overseer 1 headman 12 general duty men	WETL. 1 sub-inspector 1 overseer 1 headman 15 general duty men	MKOANI. 1 sub-inspector 5 general duty men	LEPER AND POOR SETTLEMENTS. 3 attendants.



## STAFF AND SENIOR ASSISTANTS.

(1) *Administrative Branch.*

Health Officer	....	....	Major D. S. Skelton, R.A.M.C., M.R.C.S., (Eng.), L.R.C.P. (Lond.), D.P.H. (Lond.)
Finance, Chief Clerk	....	....	Mr. Chunilal Majmudar.
Store Inspector	....	....	Mr. Lalchand Bhaichand.
Statistical Clerk	....	....	Mr. J. M. Noronha.

(2) *Executive Branch.*

Assistant Health Officer and Bacteriologist	....	....	}	A. G. Carment, M.D., B.Sc. (Edin.)
Economic Zoologist	....	....		W. M. Aders, Ph. D., F.Z.S.
Veterinary Officer	....	....		Mr. J. A. N. da Cunha.
Infectious Diseases Hospital				Sub-Assistant Surgeon Durgadas Soni.
Chief Inoculator	....	....		Sub-Assistant Surgeon F. Paul.
Chief Sanitary Inspector	....	....		Mr. F. de Souza, A.R.S.I.
Death Inspector	....	....		Sub-Assistant Surgeon V. M. Pandit.
Chief Sanitary Inspector			}	Mr. J. K. Gohel.
Pemba	....	....		
Superintendent Quarantine Station	....	....	}	Mr. I. C. Fernandes
	....	....		

*Changes in the Staff.*

I. C. Fernandes invalided home and P. Castro appointed Superintendent, Prison Island in May 1914.

At the end of October J. A. N. Cunha, Veterinary Officer resigned and Dr. W. M. Aders was appointed as Veterinary Zoologist.

## SANITARY LAW.

The Dairies' Decree No. 5. 1913. A most important measure which will in time materially influence the health of Zanzibar Town. A visit to the Town Dairies and Cowsheds of which there are some 28, compels the opinion, that a large central dépôt, where all the cows which supply milk for the Town and N'gambo could be kept, would make the supervision of this important food easy. There was one conviction of unsound milk. Boric Acid was found. For further details see Veterinary Officer's Report.

Public Health Amendment Decree of 21st April, 1914. Sub-section 4 of Section 26 of the Principal Decree is hereby repealed, and the following Sub-section substituted therefor.

"For the purpose of, and in this Decree the expressions Infectious Disease or "Dangerous Infectious Disease, shall be constituted to mean and include any "of the following diseases, that is to say. Cerebro-spinal Meningitis, Cholera, "Diphtheria, Membranous Croup, Erysipelas, Leprosy, Plague, Puerperal "Fever, Relapsing Fever, Small-pox, Typhoid Fever, Typhus Fever Trypano- "somnia, Sleeping Sickness, Yellow Fever, Tuberculosis Pulmonalis. Pro- "vided always that the British Resident shall have power by notification in "the *Official Gazette* to declare any other infectious or contagious disease as "he may think fit to be included in this definition".

## BURIAL GROUND ZANZIBAR.

Public Health Decree, 1909 (Provisional) Administration Decree, 1914.

"Whereas by a deed in writing given under the hand and seal of the First "Minister and dated 18th day of May, 1912, a piece and parcel of land at "Mwembe Ladu in the Island of Zanzibar comprising twenty-four acres or "thereabouts was hereby dedicated in perpetuity as a burial ground for the "use of the holders and followers of the tenets of the Mohamedan Religion "and whereas representations have been made to me that for the protection "of the Public Health, burials, save in such burial grounds, as are set forth in "the Schedule thereto and as hereby provided shall be wholly discontinued",



“Now under and by virtue of the powers vested in me by the Decree above named, I hereby give notice that no burials from and after the 1st day of April, 1914, shall take place in any part of the Town of Zanzibar save in the burial grounds in the said Schedule contained as aforesaid, and in the said burial ground situated at Mwembe Ladu as aforesaid and dedicated in that behalf as aforesaid.

“And provided that any person desirous of burying or interring or causing to be buried or interred any corpse in any private vault or cemetery other than those mentioned in the Schedule hereto shall apply to the Health Officer for permission in writing in that behalf”. Zanzibar 12th February, 1914.

### PUBLIC BURIAL GROUND.

The Mwembe Ladu Burial Ground dedicated as a Public Burial place has been in use since 1st April. The area of the Ground is about 23 acres and is divided into different sections for various Mohamedan Communities. A Mosque has been erected and an Imam has been engaged to read and perform burial ceremonies when required. The Mosque being right on the Public Road is frequented by passers by. A path leading from the Mosque to the Burial Ground has been laid, and a shed has been erected to enable those attending burials to rest and avoid sun and rains. Two grave diggers and a headman have been employed. Graves to the depth of six feet each are kept ready for burials. The graves are kept constantly free of overgrown weeds. Each grave is numbered and registered. The Registry being kept at the Health Office. Since 1st April, 322 Swahilis have been buried at Mwembe Ladu.

A Singalese, Roman Catholic, who having died after taking poison and being refused interment in the Roman Catholic Cemetery, was buried at the further end of the Mwembe Ladu Burial Ground.

### TOWN PLANNING AND IMPROVEMENTS.

1. The fifteen huts near Mr. Mead's house, referred to in Major Skelton's Report for 1913, have been pulled down. The cess-pits have been filled in, debris removed and the ground is being levelled.

2. Nine huts at the back of Mr. Swinerd's house have been pulled down, the place cleared of debris and levelled. All cesspits have been filled in.

3. Forty eight huts between the Health Offices and the Government Stables have been acquired and pulled down.

4. The three lairies mentioned in last year's report still exist at Malindi-Kokoni.

A potter's house in a ruinous condition has been pulled down and the site cleared, in the same district.

The Sanitary condition of this area has greatly improved and is now a large open air space.

The removal of the lairies would be a distinct improvement. There are however still the potter's yard and the lime burners kilns (interesting industries) but it would be difficult to find more suitable sites for these works, which are on the side of the creek and away from the populous district.

Houses more or less in a state of ruin and uninhabited are to be found in different areas; many of these have been removed during the year and open clean air spaces remain.

As this work goes on from year to year, the health of the Town should improve.

No building has been taken in hand, as yet, so that the Medical Officer of Health's Scheme has not been in force.

*Opium.*—It is still urged upon the Government effectively to control the importation of opium by imposing a fee for registration of opium licenses.



## PART II.—STATISTICAL.

## 1.—POPULATION.

Reliable vital statistics cannot be obtained, owing to the difficulty in estimating the population.

Taking the Town of Zanzibar, the birth rate shows a decrease of 175 for the year, the death rate shows an increase of 217 for the same period.

The following table shows the births and deaths in Zanzibar Town since 1912.

During	1914	1913	1912
Births	401	576	518
Deaths	1,239	1,022	1,284

This with the undoubtedly decreasing population shows the serious state of the Public Health.

A further analysis of the figures reveals the fact that the number of births among Swahilis has dropped from 200 in 1911 to 24 for 1914 and compares unfavourably with that of the Ismaili Khojas 139 and Ithnasheri Khojas 39 for the year.

The number of deaths of Swahilis was 589 as against 558 for 1913.

Excess of deaths over births among Swahilis shows for Zanzibar Town the abnormal figure 534 for 1914.

The outstanding causes of deaths for the year have been (a) Plague (b) Tuberculosis (c) Malaria.

One of the unsatisfactory returns as causes of deaths is Malaria; this is often diagnosed after deaths are reported, of which rather more than half, in age period 21-50.

Again when we examine the death return for Tuberculosis we find that out of 235 deaths, 183 occurred between the ages of 21-50. In both instances the death rate during this age period is much higher among males than females.

The Swahili seems to suffer more than any other race from these two diseases. He can scarcely be more prone to succumb to Malaria, but his mode of living would undoubtedly favour the spread of the tubercle bacillus.

In course of time the population, if not augmented by immigration, will become one of children and old people as the heavy death rate during what must be the most viable period of life is excessive, 68% of the total deaths occur between 21—50 years.

The death rate among the Europeans was high. The total European population during the year was 234 but the number under ordinary circumstances of leave would be diminished but taking it at that figure the European death rate was 29.5 per thousand. Say the total British population of Zanzibar and Pemba was 150 during 1914, among these were 5 deaths which gives a death rate of 33.3 per 1,000. In no case was death due to a Tropical disease.

## 2. BIRTHS.

## (a) ZANZIBAR TOWN.

The following table shows the number, sex and nationality distribution of the births in the Town of Zanzibar during the past year. In parallel is given the number of births for the preceding four years.

The number of births registered in the Town of Zanzibar during the year 1914, was

Males ...	...	...	...	...	...	224	
Females	...	...	...	...	...	177	
						—	401
Still-born	...	...	...	...	...		42

TABLE 2.  
NATIONALITY.

Nationality	During				
	1914	1913	1912	1911	1910
Swahili ...	24	91	151	207	24
Arabs ...	12	19	17	23	21
Manyama ...	...	7	16	13	1
Myamezi ...	1	1	3	...	...
Nyassa ...	2	6	10	2	...
Kavirondo ...	...	1	...	...	...
Massai ...	...	1	...	...	...
Barawa ...	...	1	...	1	...
Somalis ...	1	1	1	...	...
Gazijas ...	2	22	4	10	...
Baluchis ...	2	7	13	4	5
Washihiri ...	2	8	27	29	6
Ismaili Khojas ...	139	117	126	158	176
Ithnasheri „ ...	39	61	30		
Memons ...	20	34	4		
Mohamedans (Indians) ...	28	41	2	20	35
Bohoras ...	38	40	19	21	29
Banyans ...	65	80	55	55	53
Turks ...	...	1	...	...	...
Parsees ...	5	3	4	8	7
Persians ...	2	...	...	...	...
Goans ...	14	30	21	19	10
Europeans Portg. ...	...	1	...	...	...
„ Germans ...	1	1	5	6	4
„ British ...	2	2	...	...	...
All others ...	4	...	10	4	5
Total ...	401	576	518	590	376

TABLE 3.

Total number of births registered for the Island of Zanzibar since 1910 is as follows:—

Districts.	1914.	1913.	1912.	1911.	1910.
Town Districts ... ..	401	576	518	580	378
Mkokotoni District ... ..	511	634	580	640	529
Chwaka District ... ..	245	287	251	348	387
Mwera District ... ..	190	253	186	246	273
Total ... ..	1,347	1,750	1,535	1,814	1,567

TABLE 4.

DEATHS.

(a) ZANZIBAR TOWN.

The number of deaths registered in Town during the Year 1914 amongst:—

Males ... ..	667
Females ... ..	572
	— 1,239

Number of Deaths in:—

Town Districts ... ..	472
N. & S. N'Gambo Districts ... ..	579
Shambas nearer suburbs... ..	65
Government Hospital ... ..	71
European Hospital ... ..	6
Mkunazini Hospital ... ..	10
Gulioni Infectious Diseases Hospital ... ..	26
Kilimani Prison ... ..	...
Lunatic Asylum ... ..	3
Prison Island ... ..	4
Harbour ... ..	2
Creek ... ..	1
	— 1,239



TABLE 5.  
GENERAL CAUSES OF DEATHS.

Diseases.			Males.	Females.	Total.
(a) INFECTIOUS DISEASES.					
Beri-Beri	...	...	1	...	1
Bubonic Plague	...	...	22	11	33
Dysentery	...	...	5	5	10
Erysipelas	...	...	2	...	2
Gonorrhœa	...	...	5	...	5
Malarial Fever	...	...	93	52	145
Pneumonia	...	...	25	5	30
Pyæmia	...	...	1	1	2
Rheumatic Fever	...	...	16	22	38
Septicæmia	...	...	3	...	3
Syphilis	...	...	3	2	5
Tetanus	...	...	2	1	3
Tuberculosis	...	...	130	105	235
Whooping Cough	...	...	2	1	3
(b) GENERAL DISEASES.					
Anæmia	...	...	36	48	84
Debility	...	...	66	130	196
Diabetes	...	...	2	...	2
Jaundice	...	...	8	5	13
Starvation	...	...	3	7	10
(c) LOCAL DISEASES.					
(1) Diseases of the Nervous System.					
Apoplexy	...	...	1	...	1
Cerebral Hæmorrhage	...	...	5	2	7
Convulsion Infantile	...	...	15	28	43
Dementia	...	...	9	7	16
Eclampsia	...	...	24	2	26
Encephalitis	...	...	...	1	1
Epilepsy	...	...	5	2	7
Hydrocephalus	...	...	...	1	1
Paralysis	...	...	12	20	32
(2) Diseases of the Circulatory System.					
Endocarditis	...	...	4	3	7
Myocarditis	...	...	1	...	1
Syncope	...	...	1	...	1
Valvular Disease of heart	...	...	4	3	7
(3) Respiratory System.					
Asthma	...	...	6	9	15
Bronchitis	...	...	25	19	44
Broncho-Pneumonia	...	...	13	2	15
Pleurisy	...	...	1	...	1
(4) Digestive System.					
Abscess of Liver	...	...	1	...	1
Cancer of Liver	...	...	...	1	1
Cirrhosis	...	...	4	1	5
Diarrhœa	...	...	32	29	61
Enteritis	...	...	2	2	4
Haematemesis	...	...	1	...	1
Haemorrhage of Stomach	...	...	...	1	1
Hernia	...	...	3	...	3
„ Strangulated	...	...	6	...	6
Peritonitis	...	...	1	1	2
Ulceration of Stomach	...	...	1	...	1
Volvulus	...	...	1	...	1
(5) Urinary System.					
Acute Nephritis	...	...	8	4	12
Bright's Disease	...	...	2	...	2
Cystitis Chronic	...	...	4	...	4
Retention of Urine	...	...	...	1	1
(6) Generative System.					
Elephantiasis Scrotum	...	...	2	...	2
Orchitis	...	...	1	...	1
(Female Organ)					
Abscess of Breast	...	...	...	1	1
Puerperal Septicæmia	...	...	...	11	11

TABLE 5.—*Continued.*  
GENERAL CAUSES OF DEATHS.—*Continued.*

Diseases.				Males.	Females.	Total.
(7) <i>Connective Tissue.</i>						
	Abscess	...	...	2	...	2
	Cellulitis	...	...	2	...	2
(8) <i>Affections Consequent on Parturition.</i>						
	Nervous Exhaustion	...	...	...	3	3
	Premature Birth	...	...	...	1	1
(d) INJURIES.						
	Burns	...	...	3	1	4
	Cellulitis Scalp.	...	...	1	...	1
	Cerebral Concussion	...	...	...	1	1
	Drowning	...	...	1	...	1
	Fracture of Skull	...	...	1	1	1
	Hæmorrhage of Brain	...	...	1	...	1
	Hanging Suicidal	...	...	1	...	1
	Rifle Shot Head	...	...	1	...	1
	Shock due to Fall	...	...	3	...	3
	Stab Wounds	...	...	...	1	1
	Suicidal Mania Drowning	...	...	1	...	1
(e) SURGICAL OPERATION.						
	Intestinal Obstruction	...	...	1	...	1
	Perforation of intestine	...	...	1	...	1
(f) TUMOURS.						
	Carcinoma	...	...	...	1	1
(g) PARASITES (Nematoda)						
	Ankylostomiasis	...	...	18	...	18
	Filariasis	...	...	2	3	5

TABLE 6.  
SHOWING THE NATIONALITY OF THE DECEASED.

Nationality.			Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Swahili	...	...	47	38	32	43	54	32	50	47	52	75	51	68	589
Arab	...	...	4	4	5	3	2	2	4	5	2	5	1	4	41
Manyama	...	...	...	...	...	...	...	...	...	...	...	1	2	1	4
Myamezi	...	...	...	...	1	...	...	...	...	...	...	...	1	...	2
Nyassa	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Kavirondo	...	...	1	...	...	...	...	...	1	...	...	1	...	2	5
Kikuyuu	...	...	1	...	...	...	...	...	...	...	...	...	...	1	2
Somali	...	...	...	1	2	3	...	...	...	1	...	1	1	...	9
Gazija	...	...	5	8	8	5	9	18	11	5	9	5	3	8	94
Baluchi	...	...	...	2	2	2	1	1	1	2	...	...	2	5	18
Washihiri	...	...	4	7	3	12	8	10	4	3	11	16	6	4	88
Ismaili Khoja	...	...	5	6	5	5	9	14	10	9	6	11	6	3	89
Ithnasheri „	...	...	2	5	6	7	2	2	2	6	7	4	4	1	48
Memon	...	...	4	1	1	2	3	1	1	...	2	1	2	1	19
Mohamedans Indian	...	...	5	2	5	11	10	6	10	7	4	11	5	6	82
Bohora	...	...	3	1	5	2	1	...	3	8	...	3	1	3	30
Banyan	...	...	2	6	3	10	7	10	6	14	8	10	6	7	89
Persian	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Parsee	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Goan	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2
European German	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1
„ Roumanian	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
„ British	...	...	1	...	...	1	...	...	2	...	...	1	...	...	5
Other Castes	...	...	...	2	2	...	...	3	2	...	1	1	...	...	11
Unknown	...	...	...	...	...	...	2	1	1	2	...	1	...	...	7
			84	83	80	107	108	100	108	109	103	149	92	116	1,239

*Ages of the deceased:—*

Under one year,	123
1 to 5 years,	70
6 " 10 "	32
11 " 20 "	77
21 " 30 "	202
31 " 40 "	237
41 " 50 "	198
51 " 60 "	77
61 " 70 "	37
Over 70 "	170
Unknown	16
	1,239

TABLE 7.

## SHOWING THE PARTICULARS OF INFANTILE MORTALITY.

1. *Total number of deaths* 123

2. *Deaths amongst:—*

Males	71
Females	52—123

3. *Nationality of the deceased:—*

Swahili	11
Arab	3
Kavirondo	3
Gazija	2
Baluchi	2
Washihiri	2
Ismaili Khoja	27
Ithnasheri "	16
Memon	3
Mohamedan (Indian)	19
Bohora	6
Banyan	26
Parsee	1
Goan	1
Mangalorian	1—123

4. *Causes of deaths:—*

Malarial Fever	8
Pyæmia	1
Tetanus	3
Tuberculosis	1
Whooping Cough	3
Debility	20
Convulsions	43
Bronchitis	18
Broncho-Pneumonia	13
Diarrhœa	6
Enteritis	3
Nephritis	1
Retention of Urine	1
Abscess	1
Intestinal Obstruction	1—123

## (b) THE WHOLE ISLAND.

The number of deaths recorded month by month in Zanzibar Town and the outlying districts is shown in the following table:—

TABLE 8.

Months	Zanzibar Town	Mkokotoni	Chwaka	Mwera	Total
January	84	70	31	63	248
February	83	51	21	54	209
March	80	60	15	57	212
April	107	80	26	56	269
May	108	98	30	66	302
June	100	86	27	68	281
July	108	81	44	67	300
August	109	52	19	50	230
September	103	63	18	70	254
October	149	60	37	66	312
November	92	49	17	48	206
December	116	51	14	55	237
Total	1,239	801	299	721	3,060



TABLE 9.  
SHOWING THE TOTAL NUMBER OF DEATHS FOR THE WHOLE ISLAND  
BY DISTRICT SINCE 1910.

Districts	1914	1913	1912	1911	1910
Town Districts ... ..	1,239	1,022	1,288	1,374	1,363
Mkokotoni District ... ..	801	889	1,118	1,258	1,029
Chwaka District ... ..	299	328	782	459	402
Mwera District ... ..	721	766	1,071	740	740
Total ... ..	3,060	3,000	4,255	3,830	3,534

TABLE 10.  
METEOROLOGY.

Months.	Barometer	Wet Bulb	Dry Bulb	Maximum	Minimum	Total Rain fall	Prevailing Wind	Relative Humidity	Tension of Aqueous vapour.
January ... ..	30·012	81·4	86·3	88·0	79·7	2·84	N.N.E.	78	0·84
February ... ..	30·085	82·5	88·7	89·7	80·3	0·05	N.N.E.	74	0·82
March ... ..	30·080	82·1	87·4	87·9	79·3	8·56	N.N.E.	79	0·86
April ... ..	30·048	82·4	88·5	88·4	79·6	12·69	S.S.W.	80	0·86
May ... ..	30·076	80·1	84·5	85·0	76·3	3·84	S.S.W.	80	0·76
June ... ..	30·185	78·2	84·8	84·5	76·0	0·88	S.S.W.	80	0·76
July ... ..	30·208	75·6	83·7	83·7	74·2	0·22	Vary.	77	0·69
August ... ..	30·213	76·8	83·6	84·0	73·9	3·65	S.S.E.	79	0·73
September ... ..	30·194	76·0	82·9	85·3	74·8	1·04	S.S.E.	77	0·72
October ... ..	30·166	80·0	86·5	84·7	76·6	0·89	Vary.	77	0·77
November ... ..	30·098	81·9	87·1	88·3	78·3	4·32	"	78	0·83
December ... ..	30·107	83·6	84·5	87·7	80·2	4·37	"	76	0·84

Total rainfall during the year was 43·35.

TABLE 11.

The following table shows the Rainfall in Zanzibar Town for the past 5 years.

Months	1914	1913	1912	1911	1910
January ... ..	2·84	0·39	4·36	0·54	4·71
February ... ..	0·05	1·37	6·99	0·01	2·36
March ... ..	8·56	9·99	7·39	9·92	0·30
April ... ..	12·69	17·59	13·09	13·40	14·52
May ... ..	3·84	11·18	3·45	17·51	11·77
June ... ..	0·88	0·07	0·47	2·24	0·02
July ... ..	0·22	0·31	0·03	1·53	3·30
August ... ..	3·65	0·88	1·04	1·76	1·82
September ... ..	1·04	2·58	6·59	1·22	0·67
October ... ..	0·89	4·22	0·98	2·89	1·81
November ... ..	4·32	3·20	5·70	6·26	7·47
December ... ..	4·37	1·31	17·82	1·86	8·08
Total ... ..	43·35	53·09	67·91	59·14	56·83

The average rainfall for five years has been 56·06.



## PLAGUE.

The Port of Zanzibar was declared to be infected with Plague on 17th January 1914, but no more than 3 or 4 cases of this disease occurred, and on 4th February the Port was declared free.

In April of the same year a fresh outbreak occurred and cases continued to appear fairly regularly, till the 14th of October 1914. No more cases supervened and the Port was again declared free on 31st October of that year.

Total number of cases, 47.

Thirty-eight of these were treated in Hospital.

The total death rate for all cases was 70%.

The death rate of the cases in the Infectious Diseases Hospital was 68%.

The Medical Officer of Health treated 34 cases with Bombay Plague Vaccine in varying doses of  $\frac{1}{2}$  to 2 c.c. the number of recoveries was 11, giving a death rate of 70.5%.

TABLE 12.

SHOWING THE TOTAL NUMBER OF CASES, SEX, AGE AND NATIONALITY.

1. Total number of cases	47
2. Number of cases amongst:—	
Males	30
Females	17
	— 47
3. Ages of the patients:—	
Under 1 year	...
1 to 5 years	4
6 " 10 "	9
11 " 20 "	12
21 " 30 "	15
31 " 40 "	2
41 " 50 "	3
51 " 60 "	1
61 " 70 "	1
	— 47
4. Nationality of the patients:—	
Swahili	2
Ismaili Khoja	8
Ithnasheri Khoja	4
Mohamedan (Indian)	1
Memon	1
Bohora	6
Banyan	25
	— 47

TABLE 13.

SHOWING THE TOTAL NUMBER OF DEATHS, SEX, AGE AND NATIONALITY.

1. Total number of deaths due to plague	33
2. Deaths amongst—	
Males	22
Females	11
	— 33
3. Ages of the deceased:—	
Under 1 year	...
1 to 5 years	1
6 " 10 "	7
11 " 20 "	9
21 " 30 "	10
31 " 40 "	1
41 " 50 "	3
51 " 60 "	1
61 " 70 "	1
	— 33
4. Nationality of the deceased:—	
Ismaili Khoja	6
Ithnasheri Khoja	3
Bohora	6
Memon	1
Mohamedan (Indian)	1
Banyan	16
	— 33

TABLE 14.

THE NUMBER OF PERSONS INOCULATED AGAINST PLAGUE DURING THE YEAR.

Months	European	Indians	Arab	Swahili	Gazija	Somali	Shihiri	TOTAL.
January ...	5	1,980	129	848	32	...	5	2,999
February ...	...	1,018	173	414	13	4	8	1,630
March ...	...	129	7	120	8	...	1	265
April ...	...	122	8	36	...	1	5	172
May ...	...	25	2	7	...	...	...	34
June ...	...	165	...	...	...	...	...	165
July ...	...	782	2	31	...	...	1	816
August ...	...	389	...	4	...	1	...	394
September ...	...	2,419	...	13	...	...	2	2,434
October ...	...	382	43	17	52	...	1	495
November ...	...	42	5	7	6	1	11	72
December ...	...	...	...	...	...	...	...	...
Total ...	5	7,453	369	1,497	111	7	34	9,476

## RAT WORK IN RELATION TO PLAGUE.

Owing to Plague cases Major Skelton's proposal for liberating mole rats could not be systematically carried out.

From January to September 1,421 male rats were liberated brought in from non-infected areas (N'gambo Districts).

From 1st October all rats brought alive were destroyed for fear of rat plague infection.

It will be observed that the total number of rats destroyed during the year 48,207, fall short of that of 1913 by nearly 3,000. This may be due to better sanitation and to the fact that many of the rat gang were drafted into porter, ambulance and sanitary corps for service in British East Africa.

The total number of infected rats was 215 and it is interesting to note that this number was more than half accounted for during the last four months of the year when the epidemic of human plague had almost abated, the Port having been declared free at the end of October 1914.

TABLE 15.

RATS COLLECTED AT VARIOUS COLLECTING STATIONS.

Months	Mwembe Ladu	Mlandege	Darajani	Malindi	Office	Total
January ...	157	375	417	28	3201	4,178
February ...	91	269	515	43	2815	3,733
March ...	64	185	656	34	3262	4,201
April ...	69	220	609	...	3008	3,906
May ...	154	416	430	...	3034	4,034
June ...	155	347	405	...	3310	4,217
July ...	153	427	327	...	3516	4,426
August ...	169	350	256	...	3520	4,295
September ...	253	416	333	...	3426	4,428
October ...	152	263	251	...	3281	3,947
November ...	183	166	189	...	2787	3,325
December ...	144	192	202	...	2982	3,520
Total ...	1,744	3,626	4,590	105	38,142	48,207



TABLE 16.  
DETAILS OF RATS.

Months		Live rats	Rats brought dead in traps	Poisoned Rats	Total	Males liberated
January	...	586	1115	2477	4178	...
February	...	475	1040	2218	3733	15
March	...	418	1398	2385	4201	36
April	...	363	1281	2262	3906	32
May	...	1160	931	1943	4034	167
June	...	1549	1096	1572	4217	245
July	...	1802	1116	1505	4423	276
August	...	1874	1083	1338	4295	319
September	...	2043	839	1546	4428	331
October	...	2139	767	1040	3947	...
November	...	1130	957	1238	3325	...
December	...	840	1312	1368	3520	...
Total	...	14,379	12,935	20,893	48,207	1,421

TABLE 17.  
RETURN SHOWING NUMBER OF MALES AND ALSO FEMALE RATS WITH  
FOETUSES RECEIVED DURING 1914.

Months		Males	Females	Total	No. of pregnant rats	Foetuses
January	...	1150	3028	4178	115	723
February	...	1072	2661	3733	117	611
March	...	1061	3140	4201	102	628
April	...	973	2933	3906	76	511
May	...	921	3113	4034	96	579
June	...	885	3332	4217	97	605
July	...	958	3465	4423	107	666
August	...	963	3332	4295	106	689
September	...	1118	3310	4428	102	698
October	...	962	2985	3947	100	668
November	...	885	2440	3325	90	576
December	...	926	2594	3520	101	627
Total	...	11,874	36,333	48,207	1,209	7,581

TABLE 18.  
VARIETIES OF RATS AND PARTICULARS OF RATS INFECTED WITH RAT PLAGUE.

Months		Epimys Norvegicus (Brown rats)		Mus Rattus (Black rats)		Mus Alexandrinus (Gray rats)		Musk rats		Buku		White rats		Total	
		Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected	Number	Infected
January	...	1843	7	1158	4	1037	6	139	1	1	...	...	...	4178	18
February	...	1679	5	965	9	963	5	125	...	1	...	...	...	3733	19
March	...	1898	2	1085	2	1056	2	157	...	5	...	...	...	4201	6
April	...	1736	2	973	1	1056	...	137	...	4	...	...	...	3906	3
May	...	1818	2	1000	5	1045	1	170	...	1	...	...	...	4034	8
June	...	1864	6	925	2	1195	5	231	1	2	...	...	...	4217	14
July	...	1919	6	1097	2	1166	1	239	...	1	...	...	...	4423	9
August	...	1875	7	1101	6	1114	...	199	...	3	...	...	...	4295	13
September	...	1760	17	1095	21	1320	6	249	...	3	...	1	...	4428	14
October	...	1657	24	911	13	1131	14	247	...	1	...	...	...	3947	51
November	...	1151	6	958	7	878	2	236	...	...	...	2	...	3325	15
December	...	1383	11	874	1	1001	3	257	...	...	...	...	...	3520	15
		20,688	92	12,145	73	12,963	45	2,386	2	22	...	3	...	48,207	251

## SMALL-POX.

It is worthy of note that there has been no case of small-pox reported for Zanzibar Island for the year under investigation.

The number of vaccinations performed for the whole Island during the year is:—

Zanzibar Town	...	...	2,465
Mkokotoni	...	...	1,713
Chwaka	...	...	.....
Total	...	...	4,178

TABLE 19.

SHOWING THE NUMBER OF PERSONS VACCINATED, AND THEIR NATIONALITY.

	Europeans	Goans.	Indians.	Arabs.	Swahili.	Gazija.	Washihiri.	Total
January ...	...	...	1	1	118	...	...	120
February ...	...	...	...	...	4	...	...	4
March ...	...	...	1	56	214	...	...	271
April ...	1	3	83	21	121	1	...	230
May ...	...	...	67	28	274	5	...	374
June ...	...	...	59	24	301	2	4	394
July ...	...	4	37	16	347	4	7	411
August ...	...	...	4	40	212	...	...	256
September ...	...	...	1	38	140	...	4	183
October ...	...	...	...	1	27	...	...	28
November ...	...	...	1	2	46	...	1	50
December ...	...	...	1	...	143	...	...	144
Total ...	1	7	255	227	1,947	12	16	2,465

## TUBERCULOSIS.

The Pulmonary type of this disease, evidently on the increase, is fostered by native methods of excluding sun light and fresh air from their houses and also by the bad habit of constantly expectorating.

Of 99 sputa examined 29 showed tubercle bacilli.

The death rate reached the same high figure as in the year 1910 namely 235, and compares very unfavourably with that of 1913 which was 144.

On examination of reports from other Protectorates, it was found impossible to make any comparisons, as statistics as to age and sex distribution of this disease apparently are not given.

TABLE 20.

SHOWING THE TOTAL DEATHS, SEX, AGE AND NATIONALITY DISTRIBUTION FROM TUBERCULOSIS IN ZANZIBAR TOWN.

Total deaths, sex, age and Nationality.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1. TOTAL DEATHS ...	20	15	18	26	17	15	18	19	18	28	20	21	235
2. SEX—													
Males ...	13	7	11	14	9	8	10	13	10	15	9	11	130
Females ...	7	8	7	12	8	7	8	6	8	13	11	10	105
3. AGE—													
Under 1 year ...	...	...	...	...	...	...	...	1	...	...	...	...	1
1 to 5 years ...	...	...	...	1	...	...	...	...	2	...	...	1	4
6 „ 10 „ ...	...	...	...	...	...	...	1	1	...	1	...	2	5
11 „ 20 „ ...	...	...	4	5	1	2	3	1	1	7	1	1	26
21 „ 30 „ ...	3	4	3	8	6	4	3	9	8	4	4	4	60
31 „ 40 „ ...	9	4	7	8	3	4	7	2	6	9	10	7	76
41 „ 50 „ ...	6	5	3	3	4	3	4	4	1	5	3	6	47
51 „ 60 „ ...	2	1	1	1	3	2	...	1	...	1	1	...	13
61 „ 70 „ ...	...	1	...	...	...	...	...	...	...	1	1	...	3



TABLE 20.—*Continued.*

SHOWING THE TOTAL DEATHS, SEX, AGE AND NATIONALITY DISTRIBUTION  
FROM TUBERCULOSIS IN ZANZIBAR TOWN.—*Continued.*

Total deaths, sex, age and Nationality.	Jan.	Feb.	Mar.	April	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
4. NATIONALITY—													
Swahili ... ..	10	9	6	10	12	6	8	7	8	15	15	13	119
Arabs ... ..	2	...	2	1	1	...	...	...	...	...	...	...	6
Gazijas ... ..	1	...	2	3	2	1	3	3	2	2	2	2	23
Baluchis ... ..	...	1	1	...	1	1	...	...	...	...	...	1	5
Washihiri ... ..	2	3	1	3	...	3	2	1	4	3	...	...	22
Ismaili Khojas ... ..	1	2	...	2	...	2	2	...	...	...	...	...	9
Ithnasheri „ ... ..	1	...	2	...	...	...	...	...	1	...	1	...	5
Bohoras ... ..	1	...	1	1	...	...	1	4	...	...	...	1	9
Memons ... ..	...	...	...	...	...	...	...	...	...	1	1	1	3
Mohamedans Indian ... ..	2	...	2	2	1	1	2	2	3	4	1	1	21

## MOSQUITO BORNE DISEASES.

I do not intend to recapitulate what Major Skelton went into so fully in his report for 1913, as to the methods adopted to prevent Malaria, but only wish to draw attention to the diminished death rate from this disease, as evidence of the success of the methods inaugurated by him.

With regard to Filariasis, work began on this subject but had to be discontinued, but will be incorporated in next year's report.

The figures given below will show at a glance the effect of the work of the Mosquito-Brigade and the Quinine distribution.

TABLE 21.

Hospital.	Attendance for Malaria.		Admissions for Malaria.	
	1913	1914	1913	1914
Government Native Hospital ...	1,219	538	421	37
Mkunazini Hospital (U.M.C.A.) ...	94	83	130	47

N. B.—Figures from Khoja Dispensary for 1914 could not be obtained in time for the report.

TABLE 22.

Table showing total number of inspections made month by month and larvae found.

Months	Visits of Inspection	Larvae found	Index per 100 houses
January ...	8066	145	1·8
February ...	7372	130	1·77
March ...	8458	201	2·4
April ...	7583	221	2·8
May ...	7129	179	2·5
June ...	6132	185	3·02
July ...	7253	168	2·4
August ...	5618	106	1·8
September ...	5240	136	2·6
October ...	4502	86	1·9
November ...	4896	118	2·4
December ...	4365	91	2·08
Total ...	76,614	1,766	2·3

TABLE 23.

Total showing the number of premises inspected and Mosquito Larvae found during 1914.

Places Inspected	No. of inspections made	Larvae found	Percentage
European Quarters ...	2855	43	1.5
Indian „ ...	20914	425	2.03
Arab „ ...	4747	125	3.05
Swahili „ ...	10525	334	3.16
Washihiri, Comoro etc. ...	4705	112	2.4
Stables and Cowsheds ...	1989	51	2.6
Mosques ...	2546	52	2.04
Boats and Dhows ...	1466	120	8.2
Cess-pools ...	8838	36	0.5
Drains ...	4973	68	1.4
Gutterings ...	764	6	0.75
Wells ...	518	29	5.6
Compounds ...	1381	6	0.44
Ruins ...	1212	6	0.5
Gardens ...	2176	20	0.92
Graveyards ...	2275	15	0.64
Hotels and Coffee shops ...	1672	34	2.03
Hospitals ...	299	11	3.74
Other Places ...	2758	153	9.2
Total ...	76,614	1,766	2.3



TABLE 24.

TABLE SHOWING THE BREEDING PLACES OF THE VARIOUS KINDS OF MOSQUITOES DURING 1914.

Months	Iron Drums		Wooden Barrels		Earthen Pots, Matungis, etc.		Cisterns, Cemented Tanks, Wells, etc.		Drains, Cesspools, etc.		Empty tins and other vessels		Boats and Dhows		Gutterings to houses		Holes in trees, etc.		Swamps and other places		Total 1914		Total 1913	Rainfall 1914	Rainfall 1913											
	S		C		A		S		C		A		S		C		A		S		C					A	C	A								
1914																																				
January	...	45	...	...	28	1	...	...	...	1	1	...	8	12	...	1	3	...	...	...	...	5	8	124	21	29	8	284	9	0.39						
February	..	35	...	...	13	1	...	...	...	11	...	...	5	1	...	...	...	...	...	...	...	5	3	97	17	26	3	0.05	3	1.37						
March	..	39	7	...	16	6	...	...	...	1	20	...	9	4	...	26	3	...	3	...	...	...	11	141	59	11	91	56	7	9.99						
April	..	40	4	...	26	2	...	...	...	2	10	...	15	...	...	21	2	...	1	...	...	4	20	162	34	21	66	90	35	17.59						
May	..	42	5	1	17	4	...	...	...	2	10	4	11	3	...	12	3	1	...	2	...	2	20	121	38	28	136	19	35	11.18						
June	...	51	9	...	15	3	...	...	...	1	4	2	9	4	...	22	4	...	...	...	...	2	10	146	39	14	43	7	10	0.07						
July	...	46	2	...	12	...	...	...	...	2	4	...	5	2	...	6	...	...	...	...	...	5	7	142	18	8	37	14	7	0.31						
August	...	38	3	...	9	3	...	...	...	1	2	...	4	2	...	5	2	...	...	...	...	...	...	96	15	...	35	15	5	0.88						
September	...	36	3	...	12	2	...	...	...	1	4	...	9	14	...	...	4	...	...	...	...	2	...	105	33	...	115	22	12	2.58						
October	...	25	...	...	9	...	...	...	...	...	2	...	3	2	...	...	...	...	...	...	...	1	5	58	10	5	108	27	10	4.22						
November	...	42	1	...	9	1	...	...	...	2	6	...	7	1	...	1	3	...	...	...	...	1	8	92	14	8	108	20	12	3.20						
December	...	19	1	...	11	...	...	...	...	11	...	...	6	...	...	1	...	...	...	...	...	2	4	54	17	4	100	19	7	1.31						
Total	...	458	35	1	177	23	...	128	61	4	349	15	...	24	74	6	95	24	1	3	3	...	8	9	2	...	29	96	1338	318	110	894	327	152	43.35	53.09

S—Indicates *Stegomyia fasciata*  
C— " *Culicine* all varieties  
A— " *Anophelinae* "



Larvæ of Anophelines were found breeding in the following places:—

TOWN DISTRICTS.

Mnazi-Moja	...	Mnazi-Moja Ground.
"	...	Drain outlet leading to Creek from water trough.
"	...	Fishing boat No. 214.
Mji Impia	...	Victoria Gardens.
"	...	At the back of Government Hospital.
Sokomohogo	...	Wakf Mosque No. 9.
Baghani	...	Arab, Afadi bin Mabruki's house.
Mkunazini	...	Grave-yard at the back of Parsee Bakery.
"	...	Universities Mission.
Hurunzi	...	Mohamedalli Vali Nazarali's house.
Malindi	...	Wakf Mosque No. 10.
"	...	Smith Mackenzie's Coal Godown.
"	...	Dhow No. Z 263.

N'GAMBO DISTRICT AND SHAMBAS NEARER SUBURBS.

Ziwani	...	Ismaili Bag.
"	...	Ziwani Swamp.
"	...	Ziwani Salt Pans.
"	...	Mohamed Vali Nazarali's Shamba.
"	...	At the back of King's African Rifles Lines.
Kiungani	...	Kiungani Swamp.
"	...	Patel's Shamba.
"	...	Mission Foot ball ground.
"	...	Agricultural Department Shamba.
"	...	Abdullahsein Peera Dewji's shamba.
"	...	Luis' shamba.
"	...	Hollows near Kiungani Mission.
"	...	Esmailji Jivanji's shamba.
"	...	Kiungani Swamp drain.
Gulioni	...	Gulioni Hospital compound.
"	...	Near Railway embankment.
"	...	Opposite Gulioni Hospital.
"	...	At the back of Gulioni Hospital.
Mwembe Ladu	...	Simba Mosque swampy pit.
Sebuleni	...	Sebuleni Swamp.

MALARIA.

TABLE 25.

DEATHS DUE TO MALARIA.

Months					1914	1913	1912	1911	1910	1909	1908	Average for 7 years
January ...	...	...	...	...	9	7	12	4	16	11	19	11.1
February ...	...	...	...	...	9	18	12	11	17	9	11	12.4
March ...	...	...	...	...	9	14	20	7	20	15	11	13.7
April ...	...	...	...	...	21	24	14	12	19	13	18	17.2
May ...	...	...	...	...	15	20	14	11	13	6	25	14.8
June ...	...	...	...	...	16	24	15	28	17	5	24	18.4
July ...	...	...	...	...	11	13	17	34	29	10	30	22.0
August ...	...	...	...	...	15	11	19	26	10	8	22	15.8
September ...	...	...	...	...	10	7	12	13	20	12	13	12.4
October ...	...	...	...	...	16	9	12	22	17	10	13	14.1
November ...	...	...	...	...	6	8	12	11	13	14	6	10.0
December ...	...	...	...	...	8	4	12	10	12	10	8	9.1
Total					145	159	171	189	203	123	200	



TABLE 26.

SHOWING THE TOTAL DEATHS, SEX, AGE AND NATIONALITY DISTRIBUTION  
FROM MALARIAL FEVER IN ZANZIBAR TOWN.

Total deaths, sex, age and Nationality.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1. TOTAL DEATHS ... ..	9	9	9	21	15	16	11	15	10	16	6	8	145
2. SEX—													
Males ... ..	4	8	5	14	9	9	11	8	7	11	2	5	93
Females ... ..	4	1	4	7	6	7	...	7	3	5	4	3	52
3. AGE—													
Under 1 year ... ..	...	...	2	...	4	1	...	...	...	...	1	...	8
1 to 5 years ... ..	...	1	...	4	1	2	1	1	...	...	1	...	11
6 „ 10 „ ... ..	2	...	1	1	...	1	2	2	...	2	...	...	11
11 „ 20 „ ... ..	...	1	...	2	1	3	...	2	...	5	...	1	15
21 „ 30 „ ... ..	1	2	2	5	2	3	5	3	5	1	...	1	30
31 „ 40 „ ... ..	2	4	3	3	3	2	1	2	1	3	2	2	28
41 „ 50 „ ... ..	3	1	1	3	2	2	1	2	2	3	1	3	24
51 „ 60 „ ... ..	1	...	...	2	...	2	...	3	...	...	...	1	9
61 „ 70 „ ... ..	...	...	...	1	1	...	1	...	2	1	1	...	7
71 over 70 „ ... ..	...	...	...	...	1	...	...	...	...	1	...	...	2
4. NATIONALITY—													
Swahili ... ..	7	4	5	8	7	4	3	6	5	8	2	3	62
Arab ... ..	1	...	...	1	...	...	2	2	...	...	...	...	6
Gazija ... ..	1	1	1	1	1	3	1	...	1	1	1	2	14
Somali ... ..	...	1	1	3	...	...	...	1	...	...	...	...	6
Baluchi ... ..	...	...	...	1	...	...	...	1	...	...	...	1	3
Washihiri... ..	...	...	...	4	...	2	...	1	2	3	1	...	13
Ismaili Khoja ... ..	...	1	...	...	1	2	...	2	...	2	...	...	8
Ithnasheri „ ... ..	...	...	...	1	1	...	...	...	...	1	1	...	4
Memon ... ..	...	...	...	...	1	...	...	...	1	...	...	...	2
Mohamedan Indian ... ..	...	...	2	1	3	2	3	...	...	1	...	1	13
Banyan ... ..	...	2	...	1	1	3	2	2	1	...	1	1	14

TABLE 27.

SHOWING THE PARTICULARS OF LEPERS AT WALEZO  
LEPER ASYLUM.

Particulars.	Males.	Females.	Total.
The number of lepers on 1st January, 1914 ...	37	58	95
Number admitted during 1914 ... ..	11	9	20
Number died during 1914 ... ..	7	8	15
Total remaining on 31st December, 1914... ..	41	59	100

THE POOR HOUSE.

TABLE 28.

Particulars.	Males.	Females.	Total.
The number of patients on 1st January, 1914 ...	25	21	46
Number admitted during 1914 ... ..	61	25	86
Number discharged ... ..	20	9	29
Number died... ..	42	21	63
Number remaining under treatment ... ..	25	15	40

BACTERIOLOGICAL DEPARTMENT.

Ankylostomiasis or rather as I believe Uncinariasis is a general disease and modern methods of treatment seem to have little effect in destroying the worms in situ.

Some cases after over 20 treatments with thymol, etc., still show ova in faeces.

*Blood Films.*—The number of blood films examined was 608 of which number 416 were those of Indian Native Troops. I undertook the examination of their blood immediately on their arrival and compassed the work in 11 days, none exhibiting any malarial or other protozoal parasites. This I put down to their thorough quininization.

The health of these troops in their new surroundings was remarkable, there was only one case of pulmonary tuberculosis.

In only one case did I find micro-filariae present in blood film.

An Arab in the Public Works Department was sent showing an ulcer over the sacrum which was believed to be syphilitic, a smear from it showed no spirochaetes but micro-filariae.

At later dates I took films from this man 8-30 a.m. 2 p.m. and 8 p.m. the morning and evening films only showed micro-filariae. The man had no other symptoms than this slowly healing and breaking down sore, and slight attacks of fever.

One case showing Malaria Crescent forms, was that of a young man in a Commercial Firm who had seen some fighting in British East Africa. When he came to Zanzibar he had attacks of fever of one day duration, and films showed numerous Crescent forms. He stated that he had not lain up with fever during his active service. Apparently a case of natural immunity.

- Of Sputa examined Tubercle bacilli were found in ... .. 30 per cent.
- Of blood films examined (not including those of the Indian troops)  
malarial parasites were found in ... .. 21 „
- Of faeces examined ova of agchylostome were found in ... .. 56 „
- Ova of urinary Bilharziosis on 8 occasions.
- Amocbac on 3 occasions.
- Leprae bacilli once
- Micro-filariae once
- Bacillus Pestis was obtained 15 times from gland punctures.

The only other statement worthy of mention is that 2,022 examinations of all sorts of material were made as against 1,088 for 1913.

TABLE 29.  
EXAMINATIONS IN THE LABORATORIES DURING 1914.

Months	Blood Films	Sputa	Faeces	Urines	Smears	Nasal Scrapings	Media & Stains	Analysis	Culture Inoculations	Rat Slides	Total.
January	9	18	23	12	13	2	4	4	8	9	102
February	38	11	50	18	6	2	4	4	1	10	144
March	20	14	68	9	4	...	1	1	3	6	126
April	16	11	81	8	5	1	2	1	1	2	128
May	21	8	98	6	3	1	2	4	2	...	145
June	30	7	102	5	5	...	2	...	...	19	170
July	23	11	186	15	9	...	...	6	...	10	260
August	6	4	66	3	4	1	...	1	...	10	95
September	7	7	136	3	5	1	...	2	...	40	201
October	3	3	21	2	3	...	...	...	...	13	45
November	419	3	49	7	15	...	5	1	...	11	510
December	16	2	52	6	3	...	4	2	...	12	97
Total	608	99	932	94	75	8	23	26	15	142	2,022



TABLE 30.

## PORT SANITARY SERVICE RETURNS FOR 1914.

Months.			Particulars of steamers arrivals.						Particulars of dhow arrivals.						Total No. of passengers
			No. of steamers.	Nation- ality.		Pratique.		Total No. of passengers	No. of dhows.	Nation- ality.		Pratique.		Total No. of passengers	
				British	Foreign	Full	Restricted.			British	Foreign	Full	Restricted.		
January	...	..	34	20	14	30	4	672	41	19	22	21	19	902	1574
February	...	...	27	17	10	...	...	490	64	20	44	64	...	1110	1600
March	...	...	39	21	18	35	4	553	67	19	47	67	...	1201	1754
April	...	...	35	18	17	34	1	860	6	6	...	6	...	15	875
May	...	...	37	14	23	31	6	755	1	1	...	1	...	...	755
June	...	...	36	14	22	26	10	517	...	...	...	...	...	...	517
July	...	...	38	14	24	37	1	570	...	...	...	...	...	...	570
August	...	...	15	12	3	...	...	107	...	...	...	...	...	...	107
September	...	...	6	6	...	...	...	30	...	...	...	...	...	...	30
October	...	...	9	9	...	...	...	55	...	...	...	...	...	...	55
November	...	...	27	14	13	...	...	210	...	...	...	...	...	...	210
December	...	...	15	12	3	...	...	190	...	...	...	...	...	...	190
Total ...			318	171	157	193	28	5,009	199	65	113	160	19	3,228	8,237

## TOWN SANITATION DIVISION.

## (a) DISINFECTION.

Number of premises disinfected ... ..	...	...	1,032
„ „ Dhows „ ... ..	...	...	68
„ „ Drains „ ... ..	...	...	1,254
„ „ Premises „ for Tuberculosis, ... ..	...	...	227

## (b) DAIRIES AND STABLES.

Visits of inspection ... ..	...	...	1,836
Ordered to be cleaned out ... ..	...	...	547
Number of Dairies closed ... ..	...	...	5

## (c) INSPECTION OF SHOPS AND FOOD-STUFFS.

Grocery shops, ... ..	...	...	859
Fruit „ ... ..	...	...	154
Godowns ... ..	...	...	175
Bake houses ... ..	...	...	36
Aerated water factories ... ..	...	...	120

*Food-stuff Condemned.*

Potatoes, Bags ... ..	...	...	118
Onions „ ... ..	...	...	2,338
Beans „ ... ..	...	...	8
Rice, Mtama, etc. „ ... ..	...	...	135
Chillies „ ... ..	...	...	7
Dried fish „ ... ..	...	...	7
Sugar „ ... ..	...	...	2

## (d) WELLS.

Number of wells filled in with debris ... ..	...	...	8
„ „ „ permanently covered over ... ..	...	...	3

## (e) HOUSING.

Number of lodging and boarding houses inspected ... ..	...	...	3,273
„ „ „ ordered to be cleaned out and white-washed ... ..	...	...	771
„ boarding house closed ... ..	...	...	1

## (f) CONSERVANCY.

House closets cleaned out ... ..	...	...	2,067
Public urinals cleaned out ... ..	...	...	1,095
Cess-pits filled in ... ..	...	...	28



## (g) RUINS, COMPOUNDS, ETC.,

Ruins cleaned out	...	...	...	...	262
Vacant lands and compounds cleaned out	...	...	...	...	245
Grave-yards cleaned out	...	...	...	...	200
Gardens cleaned out, over-grown bush cut off over-hanging branches cut down, etc.	...	...	...	...	308

## (h) REMOVAL OF TOWN REFUSE.

Cart loads removed to the destructor	...	...	...	50,528
Monthly average	...	...	...	4,210·7

A good deal of further filling in and reclaiming the creek edges near the Refuse Destructor has been done during the year.

## (i) GRAVE-YARDS

Number of grave-yards registered for burials	...	...	...	26
Number of " " closed during the year	...	...	...	33
Number of persons buried at Mwembe-Ladu Public grave-yard (since first opened 1st April, 1914)	...	...	...	322
Number of paupers buried by P. H. Dept.,	...	...	...	47

## (j) NUISANCES.

Number of notices served for repairs to drains cess-pools, cowsheds whitewashing of premises, etc.	...	...	...	590
Number of notices served for the abatement of mosquito nuisances	...	...	...	805
Number of prosecutions instituted for non-abatement of nuisances	...	...	...	16
Number of convictions obtained	...	...	...	16
Number of closing orders on premises, etc., by the order of Magistrate	...	...	...	4

## CONSERVANCY.

During the year particular attention was given to the proper control of cesspits. As far as practicable these are now provided with proper re-enforced cement cesspool covers. They are sold to the owners of houses at a nominal price.

These cesspool covers facilitate inspection for mosquitoes and are very convenient to the owners when cesspits have to be emptied out; hitherto owners incurred considerable expense by having to break and then repair the surface of cesspits when emptied out.

It is hoped in the next year, the existing cesspits in Town Districts will be provided with proper cesspool covers.

## PREVENTION OF INFECTIOUS DISEASES DIVISION.

## (a) INFECTIOUS DISEASES HOSPITAL.

The following table shows the admission to the Hospital during the year 1914.

TABLE 31.

Diseases.	Remained from 1913	Admitted	Total	Died	Discharged	Remained for 1915	
Plague	1	38	39	26	13	...	
Tetanus	1	...	1	...	1	...	
Measles	...	4	4	...	4	...	
Infl. Lymphatic Glands	...	2	2	...	2	...	
Chicken-pox	...	4	4	...	4	...	
Erysipelas	...	1	1	...	1	...	
Gonorrhœa	...	1	1	...	1	...	
Abscess	...	1	1	...	1	...	
Splenitis	...	1	1	...	1	...	
Contusion of eye	...	1	1	...	1	...	
Dysentery	...	1	1	...	1	...	
Phymosis	...	1	1	...	1	...	
Pneumonia	1	2	3	...	3	...	
Bronchitis	...	2	2	...	2	...	
Asthma	...	1	1	...	1	...	
Malarial Fever	...	1	1	...	1	...	
Fracture of leg	...	1	1	...	1	...	
Anæmia	...	2	2	...	2	...	
Anchylostomiasis	...	91	91	...	91	...	(Occurred among men enrolled in "carrier" Corps for B. E. A.
Leprosy	...	4	4	...	4	...	Removed to Walezo.
Total	3	159	162	26	136	...	
Plague Contacts	1	336	337	...	337	...	
Paupers	...	10	10	...	10	...	Removed to Poor House.
Total	4	505	509	26	483	...	

The following cases included in Table 31 were admitted in Gulioni Hospital from Government Native Hospital on 22nd September, 1914, so as to make room for the wounded landed from Men-of-war etc.,

Contusion of eye	1
Dysentery	1
Splenitis	1
Abscess	1
Gonorrhœa	1
Phymosis	1
Pneumonia	2
Bronchitis	2
Fracture of leg	1
Anæmia	2
Total	13

TABLE 32.

SHOWING THE NUMBER OF PASSENGERS LANDED AT PRISON ISLAND,  
QUARANTINE STATION, DURING THE YEAR 1914.

Month	Number of passengers	By Dhow or Steamer	Whence arrived
January	8	S. S. Kilwa	Mombasa
	35	S. S. Tabora	Daressalaam
	31	S. S. Palamkota	Mombasa
	7	S. S. Golconda	"
	9	S. S. Kilwa	"
March	24	S. S. Purnia	"
	32	S. S. Prinzessin	Daressalaam
	1	S. L. Rovuma	"
April	30	S. S. Prinzessin	"
	8	Dhow	"
	30	S. S. Kilwa	Kismayu
	11	S. S. Admiral	Daressalaam
	2	S. S. Winduk	"
June	17	S. S. Adolph Woermann	"
	1	S. L. Wami	"
	2	S. S. Prasident	"
	32	S. S. "	"
	7	S. S. Prinzessin	"
July	51	S. S. Markgraf	"
	745	S. S. Konig	"
	15	S. S. Kaiser Wm.	"
	29	S. S. Emir	"
	15	S. S. Kronprinz	"
August	188	H. M. S. Pegasus	"
November	20	S. S. Newbridge	...
December	772	H. H. S. Cupid	Mombasa
	52	S. S. Assouan	...

The total number landed at this station during the year was 2,174, against 944 for 1913, of this number 20 crew of the Newbridge and 52 of the Assouan were detained by the Senior Naval Officer, 188 coolies engaged by German Company at Zanzibar for storage work on steamers, before the declaration of War and taken to Daressalaam were brought back by H. M. S. *Pegasus* and 772 men belonging to the Zanzibar Carrier and Ambulance Corps. The remaining 1,152 were passengers from British East Africa and Daressalaam detained on account of Plague Quarantine restrictions.

Of the 745 passengers landed by S. S. *Konig* 3 were found to be suffering from Plague and were immediately removed to Gulioni Infectious Diseases Hospital with 8 contacts were one of them subsequently developed plague.

There were 4 deaths at Quarantine Station during the year, out of the 772 men of the Zanzibar Carrier Corps who were sent down from Mombasa as contacts of an infectious case, landed by H. H. S. S. *Cupid*, 3 due to Pneumonia and 1 to Dysentery.



YEARLY RETURN OF DAILY TREATMENT AT THE SCHOOL DISPENSARY FOR THE  
YEAR ENDING ON 31st DECEMBER, 1914.

Diseases	No.	REMARKS.
Abscess ... ..	7	Sent to Government Hospital.
Bronchitis ... ..	202	
Boils ... ..	45	
Burns ... ..	6	
Conjunctivitis ... ..	53	
Colic ... ..	16	
Dyspepsia ... ..	287	
Eczema ... ..	14	
Gonorrhoea ... ..	5	
Jiggers ... ..	65	
Malarial Fever ... ..	217	
Neuralgia ... ..	160	
Orchitis ... ..	7	
Ringworm ... ..	52	
Rheumatism ... ..	47	
Stomatitis ... ..	12	
Soft Chancre ... ..	2	
Syphilis ... ..	2	
Scabies ... ..	287	
Sprains ... ..	237	
Toothache ... ..	138	
Ulcers ... ..	662	
Whitlow ... ..	14	
Wounds ... ..	242	
Total... ..	2,779	

Number of days school open during the year, 195.  
Daily average of sick 14.40.

PEMBA.  
TABLE 33.  
MOSQUITO INSPECTION.

Months			Chake-Chake.		Weti.		Mkoani.	
			Visits of inspection	Larvæ found	Visits of inspection	Larvæ found	Visits of inspection	Larvæ found
January ... ..	...	...	354	3	248	2	80	...
February ... ..	...	...	578	18	540	6	40	...
March ... ..	...	...	744	15	540	4	40	...
April ... ..	...	...	565	21	365	5	30	...
May ... ..	...	...	334	3	523	7	85	2
June ... ..	...	...	540	12	536	11	160	2
July ... ..	...	...	333	3	499	3	155	...
August ... ..	...	...	230	1	602	4	165	...
September ... ..	...	...	294	2	446	1	150	...
October ... ..	...	...	192	...	426	4	165	...
November ... ..	...	...	301	1	336	2	159	...
December ... ..	...	...	327	6	375	9	35	...
Total ... ..	...	...	4,792	85	5,436	58	1,264	4

ANTI-MOSQUITO WORK.

During the year 1,207 cesspits and 59 swamps at Chake Chake, 171 cesspits and swamps as Weti and 150 cesspits and 11 swamps at Mkoani have been kerosined. Drains are constantly flushed and kerosined and the over-grown bush cut down.

The Sanitary Inspector at Chake Chake and two Sub-Inspectors at Weti and Mkoani go round the town on inspection.



INFECTIOUS DISEASES.

It is gratifying to note that there have been no cases of Small-pox, Plague or any infectious disease throughout the Island during the year.

The total number of Vaccinations done throughout the Island is as follows :—

Chake-Chake	...	...	...	834
Weti	...	...	...	1,594
Mkoani	...	...	...	1,825
Total				4,253

CATTLE.

The number of cattle imported in the Island during the year is as follows :—

Chake-Chake	...	...	...	289
Weti	...	...	...	81
Mkoani	...	...	...	94
Total				464

TABLE 34.

SHOWING THE TOTAL NUMBER OF LEPERS IN THREE SETTLEMENTS IN PEMBA.

Months	N'Duni	u ngini	Kengeja	Total
Januray	47	83	50	180
February	47	15	50	182
March	38	89	55	182
April	46	97	55	198
May	47	102	56	205
June	50	110	58	218
July	53	109	58	220
August	55	111	58	224
September	56	116	59	231
October	54	95	56	205
November	55	95	56	206
December	56	115	57	228
Total average P. M.	50.33	100.58	55.66	

TABLE 35.

BIRTHS AND DEATHS.

Months		Chake-Chake		Weti		Mkoani	
		Births	Deaths	Births	Deaths	Births	Deaths
January	...	28	46	24	30	21	26
February	...	16	34	8	20	18	21
March	...	23	30	30	42	15	19
April	...	17	34	10	20	15	22
May	...	27	28	37	42	7	20
June	...	27	43	87	44	9	19
July	...	23	33	38	45	12	14
August	...	31	36	38	43	17	20
September	...	29	31	33	36	7	12
October	...	36	32	30	31	4	12
November	...	22	27	23	29	5	18
December	...	26	40	26	36	3	7
Total	...	305	414	384	418	133	210

TABLE 36.

TOTAL BIRTHS AND DEATHS.

		1914	1913	1912	1911	1910
Births	...	822	1,208	1,392	532	602
Deaths	...	1,042	1,221	1,013	1,055	1,077



## THE VETERINARY DIVISION.

REPORT BY W. M. ADERS, PH.D. F. Z. S. etc.

I was appointed Acting Veterinary Zoologist in November 1914.

With the exception of East Coast Fever, which is enzootic, the island has remained free from epizootic disease during the past year.

*Slaughter House.*—The sale of meat is under strict supervision, all stock is examined at the Government Abattoir before slaughter, and the carcasses after. All meat passed as sound is stamped with the Government Seal.

The building is still in a thoroughly good condition, no repairs are needed. In view of its ultimate removal to Pigaduri Quarantine Station no improvements are contemplated.

The following table shows the number of stock examined.

TABLE No. 1

Stock	Killed	Rejected	Total condemned	Partially condemned
Oxen ...	1,437	...	...	543
Calves ...	77	...	...	9
Goats ...	9,336	...	...	4,747
Sheep ...	1,871	...	...	986

TABLE No. 2.

ANIMALS IMPORTED DURING 1914.

Months	Cattle	Donkeys	Goat & Sheep	Horses	Other animals Mules etc.
January ...	253	...	1338	...	...
February ...	350	...	1277	1	...
March ...	430	...	1398	2	...
April ...	108	...	846	1	...
May ...	71	...	531	22	...
June ...	150	1	901	...	...
July ...	144	...	1170	...	...
August ...	...	...	136	...	...
September ...	264	...	1325	...	...
October ...	...	...	8	...	...
November ...	63	...	60	...	...
December ...	32	...	375	...	...
Total ...	1,865	1	9,365	26	...

TABLE No. 3.

ANIMALS EXPORTED DURING 1914.

Months	Cattle	Donkeys	Goat & Sheep	Horses	Other animals Mules etc.
January ...	...	...	...	...	...
February ...	4	...	...	...	...
March ...	...	...	...	...	...
April ...	...	1	...	4	7
May ...	...	...	...	5	...
June ...	...	2	...	...	...
July ...	...	1	...	...	...
August ...	...	...	...	...	...
September ...	...	...	...	...	...
October ...	...	...	...	...	...
November ...	...	...	...	...	...
December ...	...	...	...	2	...
Total ...	4	4	...	11	7



*Dairies and Cowsheds.*—Weekly inspections are made in company of one of the Sanitary Inspectors. The whole question is still most unsatisfactory. In 1914 it was agreed that the majority of the cows should be moved into the Government Stables after they have been refitted as cowsheds. Owing to lack of funds this has not been carried out. All the Dairies in Town are in a deplorable condition, not one of them should be allowed to remain open.

Owing to East Coast Fever being endemic in the Island, the erecting of model cowsheds outside the Town would be a very dangerous proceeding; there are however methods by which these difficulties could be overcome (see my special report on East Coast Fever in 1912).

I strongly urge that this matter should again come under consideration.

During the year there were four cases of Bovine Tuberculosis among the Town cows. The majority of the milch cows have never been tested with Tuberculin, this should be taken in hand at once; the native owners are antagonistic, but with tact, I am sure, their consent could be gained.

On the whole the health of the milch cows is good considering their extremely unsanitary quarters; but until better arrangements are made for their accommodation, they remain a standing menace to all communities.

*Quarantine Station.*—The Cattle Quarantine Station at Pigaduri has worked well, all cattle are now placed in quarantine for varying periods. Animals arriving from the Mainland and India are landed direct and placed in the quarantine sheds.

The milch cows from India are tested for "Surra"; the cattle from the Mainland for "Rinderpest".

Necessities at Pigaduri Quarantine Station are a dipping tank and a fly-proof stable, the former for East Coast Fever and the latter for Surra suspects. I again urge on the Government the desirability of considering these questions, as without these two adjuncts proper control of imported cattle will never be effected.

Owing to the war few cattle have been imported from the Mainland; as usual all of them proved susceptible to East Coast Fever.

The Quarantine Station is at present a clean area (that is to say there are no infective ticks). At any moment it may become infected. To avoid this a Dipping-Tank is a necessity.

There are three buildings erected, one large cattle shed, one small laboratory, one hut for native attendants.

The whole area was fenced with barbed wire during the year. In 1915 a goat and sheep shed will be built.

*Veterinary Hospital.*—The total number of cruelty cases treated was 43, of which 39 were equines and 4 bovines.

Twelve cases were prosecuted all of which resulted in convictions.

As regards the Stables and Transport Department, professional assistance was only rendered when demanded by the Superintendent.

(These figures only represent August to December records: those for the first 6 months of the year were not found in the memoranda left by the Veterinary Surgeon).

#### VETERINARY GENERAL.

*Diseases of Cattle.*—During the year there have been several cases of Trypanosomiasis, 5 cattle and one horse.

The causal organism proved to be *Trypanosoma pecorum*. Both the cattle and the horse showed a chronic infection. No deaths ensued.

Experimentally it has been shown that *Stomoxys calcitrans* and *nigra* are capable of acting as vectors, experiments with *Tabanidae* proved negative, owing to the difficulty of keeping them alive under laboratory conditions.

As *Glossina morsitans* is said to be the intermediate host of *Trypanosoma pecorum* it seems probable that cattle arrive infected from German East Africa, the Trypanosome is then carried in Zanzibar by *Stomoxys* or *Tabanidae* resulting in a very attenuated strain. (No *Glossinae* have been found in Zanzibar or Pemba).

*Sheep.*—A certain number of sheep imported from Benadir Coast were found to be suffering from footrot.

No treatment was undertaken, as the animals were imported for slaughter.



*Goats.*—Are imported in large number from German East Africa, British East Africa, the Benadir Coast and the Comoro Islands.

As usual there has been a certain amount of sickness.

Nearly all the Goats from the Comoro Islands suffer from Lobular Pneumonia, small areas of hepatisation being found at the apex of the lung.

Among those from the Mainland Pleuro-pneumonia was often present, the mortality being very high.

*Footrot.*—A certain number from the Mainland proved to be infected.

*Strongylosis.*—A small proportion were found to harbour these parasites producing a marked Enteritis.

*Ponies and Mules.*—About 20 ponies were imported from Somaliland. No disease has appeared.

In former years several cases of Horse sickness were reported.

All owners have been advised to make their stables mosquito-proof.

### IMPROVEMENT OF STOCK.

The indigenous cattle are small with a prominent hump, neat, well-formed fore and hind quarters. In nearly all of them, some Indian blood is present. They are well suited for draft purposes. The cows are very poor milkers: broadly speaking very few of them produce more than a litre a day. This might be improved by better feeding: the majority of cattle are turned out to graze, no additional food being given.

To remedy the above by selective breeding among our local stock would be a very difficult undertaking.

I propose that a number of bull calves from a well known milking strain be imported from India. The calves should be as young as possible, and on arrival be placed on pasturage infected with East Coast Fever, a few will succumb, the survivors will be immune.

On attaining maturity they should be sent to the various cattle centres of the Island and used free of charge by the natives for stud purposes.

*Milch Cows.*—The majority are imported from India and belong to the following breeds:—

*Kathiawar.*—Large cows of good stamina, very deep milkers giving about three gallons of milk a day.

*Sind.*—Somewhat smaller than the former, giving about two gallons a day.

*Benadir Coast.*—Large lanky animals, giving about one gallon a day.

*Socotra.*—Small dwarf cattle, for their size remarkably good milkers.

All milch cows in Zanzibar are stall fed, never being sent out to graze.

The feeding adopted by their Indian owners is as follows:—

Morning. Sliced cassava, sim-sim cake, cotton seed and half-crushed maize.

Evening. Sliced cassava and sim-sim cake.

In addition each cow receives 20 lbs of cut grass per day.

*Goats.*—The local goats are small and very indifferent milkers.

The introduction of new varieties would in all probability make a great improvement. In Zanzibar town there are two breeds of Indian goats both excellent milkers. Some good class animals are also obtainable from the Comoro Islands.

*Buffaloes.*—For many years past the Government have owned a small herd of Indian buffaloes. These useful draft animals should be encouraged, as in the future ploughing may become necessary, when more modern agricultural methods are introduced. Buffalo cows are prolific milkers, their milk being very rich in fat.

One buffalo calf was placed on pasturage heavily infected with East Coast Fever: the result was a sharp attack of Fever, death ensuing. Post-mortem examination revealed Koch's Blue Bodies.

A pair of Indian Buffaloes were sent to Mr. Montgomery, Veterinary Pathologist in British East Africa, who has undertaken a series of experiments to test their susceptibility in regard to East Coast Fever.

During the year a rough census of the cattle in Zanzibar and Pemba was taken. The figures are as follows:—

District				Total	District				Total
ZANZIBAR ISLAND.					PEMBA ISLAND.				
Zanzibar Town	...	...	...	552	Weti District	...	...	...	2,821
Mwera District	...	...	...	1,625	Chake-Chake „	...	...	...	2,134
Mkokotoni „	...	...	...	1,019	Mkoani „	...	...	...	1,579
Chwaka „	...	...	...	1,345					
				4,541					6,534

Milch Cows in Zanzibar Town	...	...	456.
Calves „ „ „ „	...	...	309.
No. of Cow-sheds „ „	...	...	25.

Mr. Cunha, the former Veterinary Surgeon, left the Government Service in October 1914.

All tables Nos. 1 to 5 are compiled from the figures he left.

Mr. Abdul Karim, Assistant Veterinary Inspector, has worked to my entire satisfaction; during the few months he has been attached to the Veterinary Division he has acquired a fair knowledge of meat inspection and other subjects relative to Veterinary Surgery.





## ECONOMIC ZOOLOGY.

BY W. M. ADERS, PH.D., F. Z. S., etc.

## SECTION I.

## ENTOMOLOGY IN RELATION TO PUBLIC HEALTH AND MEDICINE.

## ORDER DIPTERA (CULICIDÆ).

During the year 1914 one new Anopheline, *Anopheles mauritianus* Gr., was identified. The larvæ were found in a small collection of swamp water near Bububu.

The records of the various *Culicidæ* larvæ taken by the Mosquito Brigade are published in the Report of the Medical Officer of Health.

As usual the identification of this material has been worked out in my Department.

*Anopheles costalis*, Lw., has again proved to be the common Anopheline of the town and Island generally.

During the year many expeditions were undertaken with the Medical Officer of Health, who examined a large number of children for spleen indices and blood parasites.

It was noteworthy that at Dunga, where an exceptionally high spleen rate was found, *A. costalis* was abundant.

In other localities visited the common Culicine caught in native huts was *Stegomyia fasciata*. We were struck by the absence of *Culex fatigans*.

Numerous halts were made and standing water such as pools, back-waters of streams, etc., were examined for Culicine larvæ; many such places, which we considered ideal breeding grounds failed to provide larvæ.

At Muyuni, where there is a large permanent swamp, Anopheline larvæ in association with *Culex* were found at the edges; on examining the centre of the swamp, no larvæ were found.

In town *C. fatigans* was found breeding in cesspools and small collections of water rich in decaying vegetable matter; on the other hand *Stegomyia fasciata* showed a marked preference for clear water.

*Eretmopodites quiquerittatus*, Theo.—Has been taken on several occasions in town, always breeding in large shells, the water containing abundance of vegetable matter. There are no records of them breeding in any other kind of receptacles.

*Toxorhynchites brevipalpis*, Theo.—Larvæ were found breeding in holes in mango trees, common throughout the whole island.

Larval stage lasts 10 days, pupal stage 3 to 4 days.

They are extremely predaceous, feeding readily on larvæ of *Culex* and *Stegomyia*. On two occasions they were taken in conjunction with *Culex tigripes*.

The following larvæ were taken in Ziwani Swamp and identified:—

*Anopheles costalis*, Lw. Very common.  
*Culex fatigans*, Wie d.       "       "  
*Ochlerotatus irritans*, Theo.  
*Mimomyia Mimomyiaformis*, Newst.  
*Culex invidiosus*, Theo.  
*Culex guiarti*, Blanch.  
*Culex tigripes*, Grp.

*Mucidus mucidus*, Karsch.—Was taken on one occasion in an old tank near Ziwani Swamp, a rare form.

Mosquito prevention and destruction are undertaken by the Mosquito Brigade, my Department only acting in an advisory capacity.

The Medical Officer of Health informs me that he has obtained good results with the fish imported from Seychelles (*Haplochis playfairii*).

No new enemies of mosquito larvæ have come to hand during the year under review.

In one stock pond our fish (*Haplochis playfairii*) were attacked and destroyed by *Cybister immarginatus*; the damage has been quite immaterial.

Mosquito traps consisting of tubs have been placed in various quarters of the town; all material sent in for identification proved to be *Culex Fatigans* and *Stegomyia fasciata*.

#### ORDER SIPHONAPTERA (FAMILY PULICIDÆ).

Monthly collections were made from 15 rats, 5 of each species being used, the results are given in tabular form.

TABLE 1.  
FLEA RECORDS.

Months	Total number of <i>Xenopsylla cheopis</i>			<i>Xenopsylla cheopis</i> harboured on 15 rats
	From 5 rats <i>Mus rattus</i>	From 5 rats <i>Mus decumanus</i>	From 5 rats <i>Mus alexandrinus</i>	
January	27 ( 9 M.+18 F.)	24 (11 M.+13 F.)	26 (14 M.+12 F.)	77 (34 M.+43 F.)
February	23 ( 5 M.+18 F.)	24 ( 8 M.+16 F.)	30 (11 M.+19 F.)	77 (24 M.+53 F.)
March	27 (13 M.+14 F.)	33 (24 M.+ 9 F.)	44 (24 M.+20 F.)	104 (43 M.+61 F.)
April	29 (17 M.+12 F.)	31 ( 9 M.+22 F.)	37 (22 M.+15 F.)	97 (48 M.+49 F.)
May	39 (10 M.+29 F.)	37 (15 M.+22 F.)	30 (12 M.+18 F.)	106 (37 M.+69 F.)
June	30 (14 M.+16 F.)	30 (17 M.+13 F.)	32 (23 M.+ 9 F.)	92 (54 M.+38 F.)
July	55 (31 M.+24 F.)	42 (21 M.+21 F.)	51 (34 M.+17 F.)	148 (86 M.+62 F.)

M. = Male.  
F. = Female.

During August, September, October, November and December I was detailed for other work.

A number of *Echidnophaga gallinacea*, Westw., were taken from town rats.

During the year several Giant Rats (*Cricetomys gambianus*) were trapped, from one of them 89 *Xenopsylla cheopis* were obtained.

A series of Shrew Mice (*Pachyura murina*) were examined. Average number of fleas (*Xenopsylla cheopis*) was 4.

#### ORDER ANOPLURA.

##### HÆMATOPINIDÆ.

##### LIOGNATHUS VITULI. FROM CALF.

#### ORDER DIPTERA.

##### TABANIDÆ.

No new forms have been taken during the year, larvæ of some of the commoner species have been obtained and bred out.

##### MUSCIDÆ.

*Cordylobia anthropoghaga*, Grun. A number of larval specimens were sent in from hospitals, showing a marked increase.

A veritable epidemic broke out among our guinea-pigs, infection in every case being either in the foot or scrotum.

#### INSECTS INJURIOUS TO STORED GRAINS.

In conjunction with the Medical Officer of Health a number of food-stuffs were examined and reported on.

A large amount of flour imported from India was condemned, being heavily infested — *Ephestia cautella*, *Trilobium ferrugineum*, and *Acarus farini*.

As pointed out in my report for 1913, all grains, etc., on sale in the Bazaars are stored in open bins; it is difficult to procure a sample uncontaminated. Experiments have been undertaken in the Public Health Department to protect grains by means of Naphthaline (see Agricultural Journal of India, Vol. IX, 1914).

Excellent results were obtained, but to persuade the local store-keeper to try any new method is almost hopeless.

No new pests of stored grain have come to hand, but on the other hand their depredations are evident among a number of food-stuffs not mentioned in my previous report.



## SECTION II.

## ENTOMOLOGY IN RELATION TO VETERINARY SCIENCE.

## ACARINA.

The following ticks are new to the Zanzibar fauna:—

*Boophilus australis*, Fuller:—From local cattle.

*Haemaphysalis bispinosa*, Warb:—From imported Indian cows.

*Rhipicephalus maculatus* Neum:—From domesticated pig.

## DIPTERA.

One new blood sucking Dipteron has been obtained, *Cyclopodia greeffi*, Karsch, from flying fox (*Pteropus roltzschii*). Monthly collections of Tabanidæ have been made. The results will be published elsewhere.

## MUSCIDÆ.

A few specimens of *Gastrophilus asininus*, Br. were taken in close proximity to the town.

## SECTION III.

## ENTOMOLOGY IN RELATION TO AGRICULTURE.

During the year under review there has been no serious outbreak of any insect pests, although several new ones have come to light. Those mentioned in my last report have been more or less abundant.

*Rhinoceros Beetle*.—(*Oryctes monoceros* and *boas*).

As pointed out in my former report, by far the most serious pest in both islands.

In June Dr. K. Friederichs of Samoa visited the island and spent about 10 days inspecting and collecting information regarding the habits and prevalence of *O. monoceros* and *boas* in Zanzibar.

He concurred with me that in Zanzibar adult trees rarely succumb to the attacks of the beetle; on the other hand young trees from 2½ to 4 years old were badly attacked, being either much stunted or actually killed. Dr. Friederichs very kindly gave me some larvae infected with *Metarrhizium anisoplae*. A long series of experiments with a view to introducing the fungus were started, but unfortunately owing to the outbreak of war, all work in this direction came to an end. (I was employed for four months as Cable Censor, leaving no time for entomological work).

It was proved however that our larvae were susceptible, several succumbing.

In a control experiment one case of natural infection was found.

After consulting with the Director of Agriculture it was decided to make a large number of traps on various Government plantations; in them large numbers of larvae, pupae and adults have been destroyed.

I strongly urge that this work should be continued and enlarged upon. An European Inspector will be necessary to control the traps; he could be trained in the Government Laboratory. Dr. Friederichs accompanied me on several tours of inspection; we failed to discover any other insect pests on coconut trees.

A series of experiments have also been started to test the efficacy of various ingredients for the traps, the most satisfactory results were obtained with a mixture of donkeys dung and old rotting coconut trunks.

## CLOVES.

Mr. Dowson, B. Sc., (Mycologist to the British East Africa Protectorate) visited the islands during the month of May to study the diseases of clove trees. He has published a special report on the question. In no instance did he find any insect pests.

I am still of the opinion that the deaths among clove trees are physiological in origin; the fungus theory should be proved, when Mr. Dowson's experiments are completed.



During the year a few young clove trees were received from Pemba; the lateral and tap roots had been attacked by *Termes bellicosus*.

#### INSECTS INJURIOUS TO CITRUS TREES.

A young plantation of citrus trees was planted at Marahubi; from the start insect pests were in abundance.

*Papilio demodecus* was much in evidence, most of the young leaves and terminal shoots were destroyed; the larvæ were hand picked.

The following Coccidæ were noted:—*Mytilaspis beckii*, *Icerya purchasi*, *Dactylopius obtuses* and *Lecanium viride*.

Spraying with Kerosine Emulsion and Rosin Wash proved fairly efficacious.

Several of the older trees were attacked by borers.

(*Tragocephala variegata*). As the eggs are nearly always deposited in young lateral branches, careful removal of these with seccateurs should give good results.

As the citrus trade is of some importance in Zanzibar market, and a certain amount of fruit is exported, precautions should be taken to free them from Coccidæ.

A casual inspection of citrus fruit in the Zanzibar market, shows that a large quantity is heavily infested with *Mytilaspis beckii*. Thus if the export increases, restrictions against importation into neighbouring Colonies will certainly be enforced, probably complete prohibition.

#### INSECTS INJURIOUS TO THE MANGO (*Mangifera indica*.)

The same pests as cited in my report for 1913 were again in evidence.

*Cryptorrhynchus mangiferae* was abundant everywhere. Its actual damage to matured fruit seems slight; occasionally the pulp is disfigured by scars and a certain amount of cicatricial tissue is formed.

The young crop suffered somewhat severely; nearly all the dropped fruit contained larvæ or pupæ.

Grease bands were employed towards the end of the flowering season; in this way a certain number of adults were captured.

Nearly all mango trees are heavily infected with "Sooty Mould". Such trees are always unthrifty and covered with various Coccidæ. Young trees planted in their vicinity soon become contaminated.

#### INSECTS INJURIOUS TO TIMBER.

The following experiments were undertaken to test the efficacy of Cooper's Dip as a deterrent to Termites.

No. 1. Deal Wood ...	... Treated with 50% Cooper's Dip. Sound ...	Untreated, Badly attacked.
No. 2. Tanga Wood...	... Treated with 30% Dip. Sound ...	Untreated Few Bostrychids
No. 3. Jack Fruit ...	... Treated with 40% Dip. Many Bostrychids	Untreated do.
No. 4. Teak Wood ...	... Treated with 5% Dip. Sound ...	Untreated Sound.
No. 5. Singanoyo Boriti	... Treated with 20% Dip. Sound ...	Untreated Bostrychids
No. 6. Mangrove ...	... Treated with 50% Dip. Sound ...	Untreated Sound.
No. 7. Madagascar Teak	... Treated with 30% Dip. ...	Untreated Bostrychids.

The samples were of uniform size and were half buried in earth and left for three months.

Indian Teak can resist Termites for very long periods, being seldom attacked. Untreated Deal Wood has a very short life.

The experiments are being continued.

The Bamboo Beetle or Shot-borer (*Dinoderus minutus*) is very abundant everywhere. Treatment with Rangoon Oil as recommended by E. P. Stebbing will be tried during the coming year.

The following new insects have been identified during the year:—

#### LEPIDOPTERA.

##### *Geometridæ*

*Thalassodes digressa*, Walk. Larvæ feeding on Castor Oil.

*Trincidæ.*

*Bacculatrix loxoptila*, *Meyr.* Larvæ green in colour with black transverse stripes on dorsum. Larvæ feed on Abassi Cotton. Pupation in tough silken case on leaf, resembling an up-turned boat.

*Tricophaga abruptella*, *Well.* Larvæ taken feeding on dried leopard skins, a troublesome pest. A number of larvæ were parasitised by Chalcidæ.

## COLEOPTERA.

*Coccinellidæ.*

*Chilocorus distigma*, *Klug.* On citrus trees.

*Epilachna chrysomelina*, *F.* On citrus trees in conjunction with *Dactylopius obtusus*.

*Epilachna punctipennis*, *Muls.* On custard apple, in association with an unidentified Coccid.

*Bostrychidæ.*

*Rhizopertha dominica*, *F.* Tunnelling in Madagascar Teak.

*Cetoniidæ.* *Plæsiorrhina trivittata*, *Schaum.*

*Phymatopterix glaberrimus*, *Westw.* Adults feeding on maize leaves.

*Cocconellidæ*, *Chilomenes lunata*, *F.* Larvæ feeding greedily on *Aphis citrinella*.

*Epilachna paykulli*, *Muls.* Larvæ feeding on *Aphis citrinella*.

*Melolonthidæ.* *Entyposis impressa*. *Kolbe.* Larvæ feeding on roots of Calladium and young castor oil.

*Tenebrionidæ.*

*Pycnocerus passerinii*, *Bertol.* Larvæ and adults were found in hollows in clove trees feeding on dead wood.

## "RHYNCHOTA."

## APHIDIDÆ.

*Aphis citrinella*, *Theo.* A common pest on all varieties of citrus.

*Cerataphis lataniae*. Prevalent on all varieties of citrus, also on rose trees and various kinds of ornamental palms.

## PENTATOMIDÆ.

*Antestia variegata*, *Thumb.* On an unknown wild shrub. The few coffee grown on the island were carefully examined for this pest with negative results.

## PENTATODINÆ.

*Cyclopelta abyssinica*. *Dist.* A common pest in gardens, feeding on *Clitoria* Sp., a species of convolvulus.

## COCCIDÆ.

*Icerya aegyptiacum*. *Douglas.* On date palm.

*Icerya purchasi*. *Maskell.* On citrus trees.

*Ceroplastes rubens*. *Maskell.* On orange trees.

*Aspidiotus transparens*. *Green.* On mango.

*Dactylopius Virgatus* var. *Madagascarensis*. *Newst.* On cassava.

*Aspidiotus destructor*. *Sign.* On stalks of castor oil.

*Aspidiotus trilobitiformis*. *Green.* On leaves of *Adansonia digitata*.

*Mytilaspis beckii*. *Newman.* On all varieties of citrus.

*Lecanium punctuliferum* *Green.* On mango fruit.

*Dactylopius obtusus*. *Newst.* On *Cajanus indicus*, *Mangifera indica*, and a number of other plants.

No serious new insect pest was discovered during the year 1914, a number of insects still remained unidentified. As I pointed out in my last report protective measures are still in their infancy, my Department being still without any stock of insecticides and the necessary instruments for their use.



The Museum of the Department has steadily increased, affording interest to various people. The same plan of exhibiting only economic specimens is adhered to.

During the year in conjunction with the Medical Officer of Health a number of Lectures on Economic Zoology were given.

The syllabus was as follows:—

- I. (a) The mosquito and its life history.  
(b) Its significance. Various methods of eradication.
- II. (a) Rats, their habits, etc., in Zanzibar.  
(b) The flea as plague carrier.
- III. The house fly and other feeders.
- IV. The bed bug, its probable role in dissemination.
- V. The hook worm, a short account of its life history. How man is infected.

The lectures were well attended, the classes comprising school teachers, advanced scholars and the Subordinate Staff of the Public Health Department.

Practical demonstrations were given on the breeding haunts of mosquitoes in the open.

The lectures will be repeated during the coming year, with a new series on the most important Agricultural pests.

## SECTION VI.

### GENERAL ZOOLOGY.

The following birds have been identified:—

White backed crow. (*Corvus scapulatus*)  
 Turtle Dove. (*Turtur capicola*)  
 Little Bittern. (*Ardetta minuta*)  
 Zanzibar Woodpecker. (*Dendropicus Zanzibari*)  
 Java Sparrow. (*Munia oryzivora*)  
 Scarlet Weaver Finch. (*Pyromelana flammiceps*)  
 Brown's Red-faced Weaver Finch. (*Pytolia afra*)  
 Southern Grey-headed Sparrow. (*Passer diffusus*)  
 Senegal Bush Shrike. (*Dryoscopus senegalensis*)  
 Senegal Sun Bird. (*Cinnyris senegalensis*)  
 Black and White Hornbill. (*Lophoceros melanoleucus*)  
 African Roller. (*Eurystomus afer*)  
 Terek Sandpiper. (*Terekia cinerea*)  
 Malachite Crested Kingfisher. (*Corythornis cyanostigmata*)  
 Senegal Kingfisher. (*Halcyon senegalensis*)  
 Striped Kingfisher. (*Halcyon chelicutensis*)  
 Delaland's Fruit Pigeon. (*Vinago delalandei*)  
 Pintailed Whydah Finch. (*Vidua serena*)  
 Black bellied Bishop Bird. (*Pyromelana nigriventer*)  
 Layard's Bulbul. (*Pycnonotus layardi*)  
 Reef Heron. (*Leptorodius gularis*)  
 Allens Purple Gollinule. (*Porphyrio alleni*)  
 Wood Hoope. (*Irisor erythorhynchus*)  
 Madagascar Love Bird. (*Agapornis cana*)  
 Dusky Headed Parrot. (*Poeocephalus fuscicapillus*)  
 Pied Kingfisher. (*Ceryle rudis*)  
 Little Barbet. (*Barbatula bilineata*)  
 Scarlet Breasted Sun Bird. (*Cinnyris gutturalis*)  
 Weaver Bird. (*Amblyospiza unicolor*).

All birds in a good condition were examined for blood parasites, the following were infected:—

Barn Owl. ( <i>Haemoproetus</i> sp.)	A very heavy infection
White Backed Crow. ( <i>Corvus scapulatus</i> )	Microfilariae.
Turtle Dove. ( <i>Turtur capicola</i> )	Microfilariae.
Java Sparrow. ( <i>Munia oryzivora</i> )	Microfilariae.
Brown's Red-faced Weaver Finch. ( <i>Pytelia afra</i> )	Microfilariae.
Senegal Bush Shrike. ( <i>Dryoscopus senegalensis</i> )	Microfilariae.
Heron. (Unidentified)	Trypanosomes. Stumpy form.



The stomach contents of the various birds were carefully examined. A list of the insectivorous ones is being prepared; in some cases it has been possible to recognise the species of insects.

During the year under review the "The Wild Birds Protection Decree" was enforced; this measure cannot fail to act beneficially, although indiscriminate shooting and trapping of birds is rare in Zanzibar.

The following snakes were identified during the year:—

Boodon lineatus.	...	} Non-poisonous.
Leptodira hotamboea.	...	
Tropidonotus olivaceus.	...	
Lycophidium capense.	...	
Philothamnus semivariegatus.	...	

*Naja nigricollis*.—This interesting venomous snake was first captured near Chake Chake in Pemba; it is extremely ferocious and has the peculiar habit of spitting venom. A European Official informed me that his dog was attacked and a certain amount of venom penetrated the eye, causing violent and painful inflammation, but blindness did not ensue. *Naja nigricollis* is the only venomous snake captured during my stay in Zanzibar. Prof. G. A. Boulenger, F. R. S., informs me that in a collection sent by Sir John Kirk two venomous snakes were present, *Bitis arietans* and *Atractaspis rostrata*. No specimens of these species have come into my hands.

The following mammals have been collected and identified:

*Chiroptera*.—

Hipposideros commersoni.  
Pteropus voeltzkowi.  
Eidolon helvum.

*Insectivora*.—

Pachyura murina.  
Petrodromus sultan.  
Rhynchocyon adersi.

*Rodentia*.—

Paraxerus palliatus lastii.  
Cricetomys gambianus.

*Carnivora vera*.—

Bdeogale tenuis.

*Hyracoidea*.

Dondrohyrax neumanni.

From the above list the three shrews are of economic importance.

*Petrodromus sultan* and *Rhynchocyon adersi* destroy large numbers of *Locustidae*; *Pachyura murina* has shown marked partiality for the young larvæ of *Oryctes monoceeros* and boas. I have noticed that a few are always to be found in the Rhinoceros beetle traps.

## CONCLUSION.

The year 1914 proved most unfortunate for my Department; June and July were occupied in preparing a long series of Zoological specimens for the Dar-es-Salaam Exhibition; all the work was wasted.

After the outbreak of hostilities, I was detailed for other work until the end of the year; during this period the Economic Zoological Department ceased to exist.

I think the above reasons are sufficient to justify the brevity of my Report.

I am again indebted to Mr. Guy Marshall, Secretary to the Imperial Bureau of Entomology, and the experts of the British Museum, who have so promptly identified all material supplied to them.

Major Skelton, the Medical Officer of Health and Dr. Carment the Asst. Medical Officer of Health, have as usual assisted me in every way; without their co-operation and advice the greater part of my work would have been impossible.







